



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/064,618      | 07/31/2002  | Don Mark Lipkin      | 125686              | 8842             |

6147 7590 08/25/2003

GENERAL ELECTRIC COMPANY  
GLOBAL RESEARCH CENTER  
PATENT DOCKET RM. 4A59  
PO BOX 8, BLDG. K-1 ROSS  
NISKAYUNA, NY 12309

EXAMINER

VERSTEEG, STEVEN H

ART UNIT PAPER NUMBER

1753

DATE MAILED: 08/25/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/064,618

Applicant(s)

LIPKIN ET AL.

Examiner

Steven H VerSteeg

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 34-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-33, drawn to a method for protecting an article from a high temperature, oxidative environment, classified in class 204, subclass 192.38.
  - II. Claims 34-39, drawn to an article, classified in class 428, subclass 650.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed may be used in a materially different process. The alloy composition may be used as a bonding alloy, and may be deposited by a means such as plasma spraying. Furthermore, the method claims do not require all of the compositional limitations of the alloy claims.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation between Jennifer McNeil and Paul DiConza on July 11, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-33. Affirmation of this election must be made by applicant in replying to this Office action.

Art Unit: 1753

Claims 34-39 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Irradiated Mail***

6. The IDS papers filed on July 31, 2002 (certificate of mailing dated July 31, 2002) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS  
ORIGINALLY FILED

---

7. If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the

Art Unit: 1753

above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

8. If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents. If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

### *Specification*

9. The disclosure is objected to because of the following informalities: "comprisingfrom" should be "comprising from" at [0022], line 5, and "andheat" should be "and heat" at [0022], line 13.

Appropriate correction is required.

### *Claim Objections*

10. Claims 11, 12, 24, and 25 are objected to because of the following informalities: "claim7" should be "claim 7" in claim 11 at line 1; "claim11" should be "claim 11" in claim 12 at line 1; and "claim1" should be "claim 1" at claim 24 at line 1. Claim 12 depends from claim

Art Unit: 1753

11 and contains all of the limitations of claim 11. Therefore, claim 12 is objected to for the same reasons as claim 11. Claim 25 depends from claim 24 and contains all of the limitations of claim 24. Therefore, claim 25 is objected to for the same reasons as claim 24. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-6, 13-17, and 23-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,153,313 to Rigney et al. (Rigney) in view of US 2001/0012568 A1 to Bose et al. (Bose).

13. For claim 1, Applicant requires a method for protecting an article from a high temperature, oxidative environment comprising providing a substrate, providing an ion plasma deposition target comprising from about 2 atom percent to about 25 atom percent chromium and the balance comprising aluminum, and depositing a protective coating onto the substrate using the target in an ion plasma deposition process.

14. Rigney discloses a method for depositing a protective coating (col. 4, l. 40-62) comprising providing a substrate 10 and PVD depositing (col. 5, l. 21-25) a bond coat layer 24 comprising up to 50 atomic percent aluminum and 0.5-15 atomic percent chromium (Table I).

Art Unit: 1753

15. Rigney does not disclose the PVD depositing to be ion plasma deposition, but does indicate that the PVD can be sputtering or any other suitable deposition technique (col. 5, l. 21-25).

16. Bose discloses that a suitable technique to deposit a bond coat layer such as that used by Rigney is cathodic arc deposition [0025] which is ion plasma deposition.

17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rigney to use cathodic arc deposition because it is a well known deposition method for depositing bond coat layers for turbine blades and Rigney can use any deposition method for depositing the bond coat layer of the turbine blade.

18. For claim 2, Applicant requires the target to comprise another metal such as zirconium. Rigney discloses that zirconium can be used (Table I).

19. For claim 3, Applicant requires up to 4 atomic percent of a material such as zirconium and up to about 0.2 atomic percent carbon. Rigney discloses trace amounts of carbon may be present (col. 6, l. 55-64) and 0.5 atomic percent zirconium (Table I).

20. For claim 4, Applicant requires about 9 atomic percent chromium, about 1 atomic percent zirconium, and the balance comprising aluminum. For claim 5, Applicant additionally requires about 2 atomic percent tantalum. Rigney discloses the chromium content can be 0.5-15 atomic percent (Table I), thus up to 9 atomic percent is obvious, 0.5 atomic percent zirconium (Table I) which is about 1 atomic percent, 0.1-3 atomic percent tantalum (Table I) which is about 2 atomic percent, and 50 atomic percent aluminum (Table I).

21. For claim 6, Applicant requires about 9 atomic percent chromium, about 1.5 atomic percent of hafnium and silicon, and the balance aluminum. Rigney discloses the aluminum and

Art Unit: 1753

chromium as noted above. Rigney also discloses 0.1-2.0 atomic percent silicon and 0.01-2.0 atomic percent hafnium (Table I) which meets Applicant's claimed limitations.

22. For claim 13, Applicant requires heat treating after depositing the protective coating. Rigney provides a heat treatment (col. 5, l. 39-40).

23. For claim 14, Applicant requires the heating to be 30 minutes to 8 hours for 700 – 1200 Celsius. Rigney discloses heat treating for 2-4 hours at about 980 Celsius (col. 5, l. 39-42).

24. For claim 15, Applicant requires the substrate to comprise nickel, iron, or cobalt alloy. For claim 16, Applicant requires the substrate to comprise superalloy. For claim 17, Applicant requires the superalloy to comprise a component for service in a hot gas path of a gas turbine engine. Rigney discloses the substrate to comprise nickel superalloy (col. 4, l. 66 – col. 5, l. 1) for use in a gas turbine engine (col. 1, l. 6-14).

25. For claim 23, Applicant requires the substrate to be grounded. Rigney does not disclose a bias on the substrate; hence, the substrate is obviously grounded.

26. For claim 24, Applicant requires the protective coating to be about 5-250 microns. For claim 25, Applicant requires the thickness to be 25-75 microns. Rigney discloses the thickness of the bond coat layer to be 10-125 microns with 15 being preferred (col. 5, l. 19-31). Thus, about 25 microns is obvious.

27. For claim 26, Applicant requires coating the layer with a thermal barrier coating. For claim 27, the coating is YSZ. Rigney coats the layer with a YSZ layer (col. 5, l. 4-10).

28. For claim 28, Applicant requires at least 80 volume percent of a single phase. For claim 29, Applicant requires at least 80 volume percent B2 structures aluminum intermetallic phase. For claim 30, Applicant requires at least two phases. For claim 31, Applicant requires the two



Art Unit: 1753

phases to be B2-structures aluminide intermetallic phase and platinum aluminide. Rigney discloses predominate (i.e. obviously around 90%) beta phase (col. 3, l. 10-25). Hence, there are two phases with a predominate beta phase.

29. Claims 7-12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,153,313 to Rigney et al. (Rigney) in view of US 2001/0012568 A1 to Bose et al. (Bose) as applied to claims 1 and 30 above, and further in view of US 6,207,297 B1 to Sabol et al. (Sabol).

30. For claim 7, Applicant requires coating the substrate with a metal layer prior to depositing the protective coating. For claim 8, Applicant requires the coating to comprise platinum, palladium, nickel, or cobalt. For claim 9, Applicant requires heat treating after depositing the coating. For claim 10, Applicant requires the heat treatment to be 30 minutes to 8 hours at 900-1200 Celsius. For claim 11, Applicant requires the thickness to be 2-25 microns. For claim 12, Applicant requires the thickness to be 2-6 microns. For claim 18, Applicant requires the substrate to comprise at least one coating.

31. Rigney in view of Bose is described above, but does not deposit a layer between the substrate and the protective bond coat layer. However, the heat treatment will meet the limitation of claims 9 and 10.

32. Sabol discloses depositing a layer containing nickel or cobalt between the bond coat layer and the substrate because it acts as a barrier to diffusion materials through it from both the substrate and the basecoat (col. 4, l. 42-51). The layer has a thickness of preferably 2 microns because at greater than 25 microns, the adherence of the layers to it will suffer (col. 4, l. 51-56).

33. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rigney in view of Bose to use a nickel or cobalt containing

Art Unit: 1753

layer between the bond coat layer and the substrate because of the desire to act as a barrier to diffusion materials through it from both the substrate and the base coat.

34. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,153,313 to Rigney et al. (Rigney) in view of US 2001/0012568 A1 to Bose et al. (Bose) as applied to claim 1 above, and further in view of US 5,312,584 to Frasier et al. (Frasier).

35. For claim 19, Applicant requires the target to be manufactured by casting or powder metallurgy processing.

36. Rigney in view of Bose is described above, but does not disclose the method of making the target. Thus, any method of making a target would be obvious.

37. Frasier disclose that targets can be made by casting (abstract).

38. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rigney in view of Bose to make the target by casting because casting is a well known method of making targets.

39. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,153,313 to Rigney et al. (Rigney) in view of US 2001/0012568 A1 to Bose et al. (Bose) as applied to claim 1 above, and further in view of US 4,109,061 to Beale et al. (Beale).

40. For claim 20, Applicant requires providing a negative bias on the substrate. For claim 21, the negative bias is 10-1000 volts. For claim 22, the bias is 50-250 volts.

41. Rigney in view of Bose is described above, but does not disclose biasing the substrate.

42. Beale discloses applying a negative 60 volt bias to the substrate in forming a bond coat layer to control the composition and structure of the bond coat layer (col. 4, l. 52-63).

Art Unit: 1753

43. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rigney in view of Bose to bias the substrate to negative 60 volts because of the desire to control the composition and structure of the bond coat layer.

44. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,153,313 to Rigney et al. (Rigney) in view of US 2001/0012568 A1 to Bose et al. (Bose) and US 4,109,061 to Beale et al. (Beale).

45. For claim 32, Applicant requires a method for protecting an article from a high temperature, oxidative environment comprising providing a substrate of a nickel-based superalloy, providing an ion plasma deposition target comprising 2-25 atomic percent chromium, up to 4 percent of a material such as zirconium, up to about 0.2 atomic percent carbon, and the balance aluminum, depositing a protective coating on the substrate while applying a negative bias to the substrate, and heat treating the protective coating to result in a coating that comprises B2-structures aluminide intermetallic phase.

46. As noted above, Rigney discloses all of the limitations of claim 32 except for biasing the substrate and ion plasma deposition.

47. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rigney to use cathodic arc deposition because it is a well known deposition method for depositing bond coat layers for turbine blades and Rigney can use any deposition method for depositing the bond coat layer of the turbine blade.

48. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rigney bias the substrate to negative 60 volts because of the desire to control the composition and structure of the bond coat layer.

Art Unit: 1753

49. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,153,313 to Rigney et al. (Rigney) in view of US 2001/0012568 A1 to Bose et al. (Bose) and US 4,109,061 to Beale et al. (Beale) as applied to claim 32 above, and further in view of US 6,207,297 B1 to Sabol et al. (Sabol).

50. For claim 33, Applicant requires the substrate to be coated with a metal such as nickel and cobalt and then heat treating.

51. Rigney in view of Bose and Beale is described above, but does not disclose the use of a coated substrate. Rigney does, however, disclose the heat treating limitation. Sabol is also described above.

52. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rigney in view of Bose and Beale to use a nickel or cobalt containing layer between the bond coat layer and the substrate because of the desire to act as a barrier to diffusion materials through it from both the substrate and the base coat.

### ***General Information***

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (703) 308-0661.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Palestine Jenkins at (703) 308-3521.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (703) 308-0661.

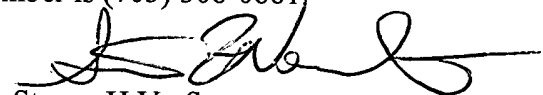
Art Unit: 1753

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (703) 305-4473. The examiner can normally be reached on Mon - Thurs (7:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Steven H VerSteeg  
Primary Examiner  
Art Unit 1753

shv  
August 19, 2003